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25453 7590 10/08/2009

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MAILSTOP: XRX2-020  
ROCHESTER, NY 14644

EXAMINER

CHENG, PETER L.

ART UNIT

PAPER NUMBER

2625

DATE MAILED: 10/08/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,608	12/11/2003	Raja Bala	D/A1453	8506

TITLE OF INVENTION: SPATIALLY VARYING LUMINANCE COMPRESSION GAMUT MAPPING SYSTEM AND METHOD

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	01/08/2010

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

### HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER:** Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

## PART B - FEE(S) TRANSMITTAL

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**INSTRUCTIONS:** This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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### Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or by facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)

(Signature)

(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,608	12/11/2003	Raja Bala	D/A1453	8506

TITLE OF INVENTION: SPATIALLY VARYING LUMINANCE COMPRESSION GAMUT MAPPING SYSTEM AND METHOD

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	01/08/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHENG, PETER L	2625	358-001900

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

"Fee Address" indication (or "Fee Address" indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,  
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 \_\_\_\_\_  
2 \_\_\_\_\_  
3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY AND STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent):  Individual  Corporation or other private group entity  Government

4a. The following fee(s) are submitted:

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

Issue Fee  
 Publication Fee (No small entity discount permitted)  
 Advance Order - # of Copies \_\_\_\_\_

A check is enclosed.  
 Payment by credit card. Form PTO-2038 is attached.  
 The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.  b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature \_\_\_\_\_

Date \_\_\_\_\_

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This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS; SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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PATENT DOCUMENTATION CENTER				CHENG, PETER L
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MAILSTOP: XRX2-020				PAPER NUMBER
ROCHESTER, NY 14644				DATE MAILED: 10/08/2009

## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 845 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 845 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/733,608	BALA, RAJA	
	<b>Examiner</b>	<b>Art Unit</b>	
	PETER L. CHENG	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTO-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1.  This communication is responsive to the amendment filed, 6/10/2009.

2.  The allowed claim(s) is/are 1,3,4,7,9-12,14,15,18-22.

3.  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)  All b)  Some\* c)  None of the:

1.  Certified copies of the priority documents have been received.

2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3.  Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4.  A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5.  CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.

(a)  including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached 1)  hereto or 2)  to Paper No./Mail Date \_\_\_\_\_.

(b)  including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6.  DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1.  Notice of References Cited (PTO-892)

5.  Notice of Informal Patent Application

2.  Notice of Draftsperson's Patent Drawing Review (PTO-948)

6.  Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_.

3.  Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_.

7.  Examiner's Amendment/Comment

4.  Examiner's Comment Regarding Requirement for Deposit  
of Biological Material

8.  Examiner's Statement of Reasons for Allowance

9.  Other \_\_\_\_\_.

/P. L. C./  
Examiner, Art Unit 2625

/King Y. Poon/  
Supervisory Patent Examiner, Art Unit 2625

**EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with John S. Price (Reg. No. 56,581) on **9/24/2009**.

2. The claims have been amended as follows:

**In claim 1:**

**On line 1,**

change

"A luminance dynamic range system, comprising:"

to

--- A luminance dynamic range system[[,]] comprising:---;

**On lines 8 - 13,**

change

"a luminance compression module for gamut mapping that varies across different parts of the input image, spatially adapting a luminance compression function according to local image characteristics in such a manner as to preserve both shadow detail and overall image contrast, responsive to  $L_f$  and  $L_{in}$  for performing luminance compression on the input component  $L_{in}$  to output a compressed luminance signal  $L_{out}$  that is within an achievable luminance range of an output device,"

to

--- a luminance compression module [[for]] which performs gamut mapping that varies across different parts of the input image~~[[.]]~~ by spatially adapting a luminance compression function according to local image characteristics in such a manner as to preserve both shadow detail and overall image contrast, and is responsive to  $L_f$  and  $L_{in}$  for performing luminance compression on the [[input]] luminance component  $L_{in}$  to output a compressed luminance signal which is represented as an overall compression function  $L_{out}$  that is within an achievable luminance range of an output device; ---;

On line 15,

change

"thereby, producing an overall compression function;"

to

--- thereby, producing [[an]]the overall compression function  $L_{out}$ ; ---;

**On line 17,**

change

"shadow detail;"

to

--- the shadow detail; ---;

**On lines 17 - 18,**

change

"wherein the functions  $L_{comp1}(L_{in})$ ,  $L_{comp2}(L_{in})$  and  $\alpha(L_t)$  are all 1-dimensional functions only of  $L_{in}$ ;"

to

--- wherein the functions  $L_{comp1}(L_{in})$  and  $L_{comp2}(L_{in})$  [[and  $\alpha(L_t)$ ]] are [[all 1-dimensional]] functions only of  $L_{in}$ , and the function  $\alpha(L_t)$  is only a function of  $L_t$ ;

---;

**On lines 19 - 21,**

change

"the overall compression function is spatially smooth and to map a luminance dynamic range of the input image to a more limited luminance dynamic range of the output device"

to

--- the overall compression function  $L_{out}$  is spatially smooth and [[to map]]maps a luminance dynamic range of the input image to a more limited luminance dynamic range of the output device ---;

**In claim 3:**

**On line 1,**

change

"wherein the function  $L_{out}$  is"

to

--- wherein the overall compression function  $L_{out}$  is ---;

In claim 12:

On lines 9 - 13,

change

"processing  $L_f$  and  $L_{in}$  through a luminance compression module for gamut mapping that varies across different parts of the input image, spatially adapting a luminance compression function according to local image characteristics in such a manner as to preserve both shadow detail and overall image contrast, to obtain a compressed luminance signal  $L_{out}$  that is within an achievable luminance range of an output device;"

to

--- processing  $L_f$  and  $L_{in}$  through a luminance compression module [[for]]which performs gamut mapping that varies across different parts of the input image[[,]] by spatially adapting a luminance compression function according to local image characteristics in such a manner as to preserve both shadow detail and overall image contrast[[,]]in order to obtain a compressed luminance signal which is represented as an overall compression function  $L_{out}$  that is within an achievable luminance range of an output device;---;

On line 15,

change

"thereby, producing an overall compression function;"

to

--- thereby, producing [[an]]the overall compression function  $L_{out}$ ; ---;

On line 16,

change

"overall image contrast"

to

--- the overall image contrast ---;

On line 17,

change

"shadow detail;"

to

--- the shadow detail; ---;

On lines 17 - 18,

change

"wherein the functions  $L_{comp1}(L_{in})$ ,  $L_{comp2}(L_{in})$  and  $\alpha(L_f)$  are all 1-dimensional functions only of  $L_{in}$ ,"

to

--- wherein the functions  $L_{comp1}(L_{in})$  and  $L_{comp2}(L_{in})$  are all 1-dimensional functions only of  $L_{in}$ , and the function  $\alpha(L_f)$  is only a function of  $L_f$ ;  
---;  
---

On lines 19 - 21,

change

"the overall compression function is spatially smooth and to map the luminance dynamic range of the input image to the more limited luminance dynamic range of the output device"

to

--- the overall compression function  $L_{out}$  is spatially smooth and maps the luminance dynamic range of the input image to a more limited luminance dynamic range of the output device ---;

***Allowable Subject Matter***

3. Claims 1, 3, 4, 7, 9 – 11, 12, 14, 15, 18, and 20 - 22 are allowed. The following is an examiner's statement of reasons for allowance.

Independent claim 1 is directed to a *luminance dynamic range system*, and independent claim 12 is directed to a *method for luminance dynamic range mapping*.

Claims 1 and 12 identify the uniquely distinct features of:

wherein the low pass filter allows shadow regions to pass through as low luminance, and filters out detail in high-contrast regions;

where the luminance compression module combines two compression functions  $L_{comp1}(L_{in})$  and  $L_{comp2}(L_{in})$  via a blending function  $a(L_f)$ ,

wherein the function  $L_{comp1}$  is optimized for preserving the overall image contrast and the function  $L_{comp2}$  is optimized for preserving the shadow detail.

Applicant's claims include elements which are not taught by the prior art nor rendered obvious. While it is well-known in the art to combine compression functions to arrive at an overall compression function (e.g., **GALLAGHER [US Patent 6,317,521 B1]** or **GALLAGHER [US Patent 6,275,605 B1]**), the low-pass filter of the instant application

and the nature of each of the individual compression functions,  $L_{comp1}(L_{in})$  and  $L_{comp2}(L_{in})$ , differ from what is taught in the prior art.

***Conclusion***

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter L. Cheng whose telephone number is 571-270-3007. The examiner can normally be reached on MONDAY - FRIDAY, 8:30 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, King Y. Poon can be reached on 571-272-7440. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/King Y. Poon/  
Supervisory Patent Examiner, Art Unit 2625  
/plc/  
October 7, 2009